



Development of Islamic-Science Integrated Physics E-Module to Build the Character Profile of Pancasila Students for High School Students

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Abstract:

The Pancasila student profile (PSP) is a form of translation of the national education system. One of the PSP dimension characters is faith, piety to God Almighty, and noble character. Educators need to implement the PSP dimension thoroughly from early childhood education so that each learner becomes a competent lifelong learner, has character, and behaves according to the values of Pancasila. This can be realized of them by using integrated e-module teaching materials. This research aims to develop Islamic-Science integrated e-module teaching materials that are valid, practical, and effective for building PSP characters of high school students. The type of research used is research and development. The research instrument used a validation sheet, observation of learning implementation, student response questionnaire, and pre-test and post-test questions. The trial was conducted in class X with a total of 36 students. The results of the study obtained validity with a very valid category, for practicality based on the results of observations obtained with excellent qualifications, while for effectiveness seen from the N-gain test pre-test and post-test increased with an average of 0.70 in the medium category and received a positive response from the analysis of the students' questionnaire. These results indicate that the Islamic science integrated e-module for building the PSP character of high school students has met the valid, practical, and effective criteria.

Keywords: e-module; Islam-science integration; Pancasila student profile character

INTRODUCTION

The world of education teaches many things to humans regarding human nature and background, both in terms of identity, society, state of mind, religion, and others. Educators, students, expert staff, and education providers are objects and subjects that form a culture that lives amid the educational process (Henricus, 2015). Ki Hadjar Dewantara's thoughts on Indonesian education are about how to shape students to become whole human beings following the nature and development of the times (Siswoyo, 2013; Ibrahim & Hendriani, 2017; Nurkholida, 2018; Sugiarta et al., 2019). As a nation rich in cultural values, Ki Hadjar Dewantara utilizes and makes it a force to develop the



character of students in line with the philosophical values of Pancasila (Hendratmoko et al., 2017; Abi, 2017).

Pancasila values are very much needed in the learning process to be instilled in students, but Pancasila values do not only reach planting but need strengthening. This is so that they will be accustomed to actions and behavior that are under Pancasila values (Jannah & Fahlevi, 2018) has made PSP one of the Visions and Missions of the Ministry of Education and Culture as stated in Permendikbud Number 22 of 2020 concerning the Strategic Plan of the Ministry of Education and Culture for 2020-2024. The background to the emergence of PSP is the rapid advancement of technology, socio-cultural shifts, environmental changes, and differences in the future world of work in education at every level and culture (Denison et al., 2004). According to Irawati et al. (2022), This PSP is one of the efforts to build student character and strengthen academic competence. In addition, it also aims to develop the potential of students to become human beings who have faith and are devoted to God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens.

Integration between science and religion can be realized in schools formally so that students get both sciences as a whole. Integrating Islam with science can create a complete understanding by students in learning a lesson both in terms of scientific knowledge and Islamic religious knowledge (Qur'an) to form a generation that is *uhul albab* (Astutik et al., 2022). The integrated education system balances Islamic and secular education by paying sufficient attention to religious instructions upholding cultural values (Abdi, 2017). The integration paradigm does not merge between various sciences but combines the character and nature of the knowledge in all its dimensions, including science (Elagouni et al., 2012). Integrated learning is essential and is expected to improve the quality of education (Orrell, 2004). Integrated education is a way to produce individuals who are intellectually, spiritually, emotionally, and physically balanced and harmonious (Ortiz-Fournier et al., 2010).

Learning so far separates general material from religious knowledge, resulting in a dichotomy of knowledge in students' understanding (Rahmawati & Bakhtiar, 2019; Shofa et al., 2020). Dichotomy in learning can lead to failure in producing balanced individuals, so an integrated concept must be carried out (Amalia & Suliyannah, 2020). In the implementation process, many teachers have not tried integrating physics material with



the Qur'an (Sukarno & Zainuri, 2020). Integrated learning with science can be applied in physics learning, but integrating Qur'an values in physics learning has not been fully implemented in school learning (Chandra & Lizelwati, 2022). Several e-module developments not yet integrated with Islam science include: (Pratono et al., 2018; Serevina et al., 2018; Darmaji et al., 2019; Yusuf et al., 2020; Cahyani et al., 2020; Bimo, 2021; Maghfiroh et al., 2023). The current reality is that it is difficult to find in the process of teaching and learning by instilling religious values that can connect science and religion (Chandra & Lizelwati, 2022). However, as a basis for the development and study of relevant research results, there is research on the development of integrated Islamic science e-modules (Aulianingsih et al., 2021; Diani et al., 2021; Hafiza & Suparwoto, 2021; Padwa & Erdi, 2021; Subarkah et al., 2021; Nurmayuli, 2023).

The success of the learning process depends on the role of the teacher, students, and learning media. The teacher acts as a learning facilitator who can choose and use learning media according to the needs of students (Fajriah & Churiyah, 2016). The availability of appropriate learning media and learning resources will help students understand a science (Gusmida & Islami, 2017). Thus, teachers must develop appropriate learning media to increase students' awareness of intellectual, emotional, and spiritual aspects.

Geraldin (2005) states that learning will be more effective if more attention is paid to individual students than to the group so that printed modules are appropriate for learning media (Mayembe & Nsabata, 2020). However, along with the development of ICT and practicality goals and efficiency for printing costs, many electronic-based modules (e-modules) have been developed which can be accessed via Android/smartphones or smartphones. E-modules are electronic learning media that students can use via computers/laptops or gadgets both online and offline (Fasih & Danang, 2015; Aryawan et al., 2018; Padwa & Erdi, 2021). E-modules can also be used by students independently according to their level of learning ability. E-modules are designed and structured in easy-to-understand language as a form of effort to help students learn.

In addition, teachers must be more flexible in choosing learning strategies that meet the needs of students and develop strategies to manage student acquisition in learning experiences that emphasize students. The methodology or approach is a comprehensive and extensive set of expectations, standards, and ideas appropriate for achieving learning objectives (Bamber & Tett, 2000). The learning approach is the initial stage or perspective



of the educational experience. The logical methodology or scientific approach is student-focused, in which students directly investigate and construct learning materials. The logical methodology in the educational experience is planned so that students can build material and ideas, through stages, especially from the paying attention stage to the conveying stage. The logical methodology/scientific approach comprises several successive stages of training, particularly paying attention, getting clarifications about things, gathering, trying, and conveying (Blum, 2021).

Science learning in high school is expected to provide open opportunities for students to develop interests normally, cultivate the ability to get clarifications about things and look for answers to regular oddities as evidence, and develop logical reasoning. Learning science (physics) demonstrates real-world forces, thinking, and norms about nature and methods for decisive reasoning, practicing definitive thinking skills, and making judgments. Science content must be stacked with the material displayed so that students can reduce their thinking and capacities.

One of the science materials that can be packaged is teaching materials in the form of electronic modules (e-modules). According to Astuti et al. (2019), modules are well-organized teaching materials outlined in specific learning programs. The primary justification for learning through modules is expanding school-based mastery and freeing resources, time, energy, and workspace to achieve desired goals (Sidiq et al., 2021). The presentation material is planned to broaden students' understanding to interpret the importance of learning material and make it easier for students to learn, considering that students develop without obstacles without the help of a facilitator. The science that shows material as a module is a material that is bundled directly with attention to the increasing needs of students with the proper techniques and methodologies so that the psychological part of learning outcomes is also achieved appropriately.

In addition, learning through Islamic values will improve student academic achievement (Purwati et al., 2018). When the concept of physics is associated with the Qur'an in learning, students feel interested because they get new things that have never been obtained before (Sriatun et al., 2018). A study (Amin et al., 2022) states that learning through integrating science and Islamic values can improve student learning outcomes. This was also found in research by Taja et al. (2021) that integrating Islam and science can improve student learning outcomes and creativity along with increasing character.



The results of an interview with a physics teacher at a Pitungan 1 high school found that: (1) The teacher only occasionally delivered physics material related to the Qur'an due to a lack of teacher references, in this case. This resulted in general knowledge and religious knowledge being taught in schools as separate lives and not in accordance with the school's vision based on faith and piety, (2) worksheets used by students in schools, only from certain publishers who were less attractive. on students and (3) the learning outcomes of class X students with a percentage of 43% completeness. Teachers are required to be more innovative in every learning activity to stimulate students' thinking skills.

It is necessary to develop a physics e-module that contains Qur'anic verses related to the character of the Pancasila profile to overcome this problem. When the concept of physics is associated with the verses of the Qur'an, students feel interested because they get new things that have never been obtained. Integrating Islam and science in learning can be a solution for instilling spiritual values in students. The existence of verses of the Qur'an as supporting material explanations is expected to motivate students to increase faith, piety, gratitude, and understanding of the equipment described. Pancasila character Profile of high school students

RESEARCH METHOD

This research is research & development or commonly referred to as Research and Development (R&D). This method was chosen in accordance with the goals and ultimate objectives of this study, which were aimed at finding and developing learning modules into Islamic-science integrated learning e-modules to build the character of the Pancasila profile of participants high school students The chart of e-module development procedures is shown in Figure 1.

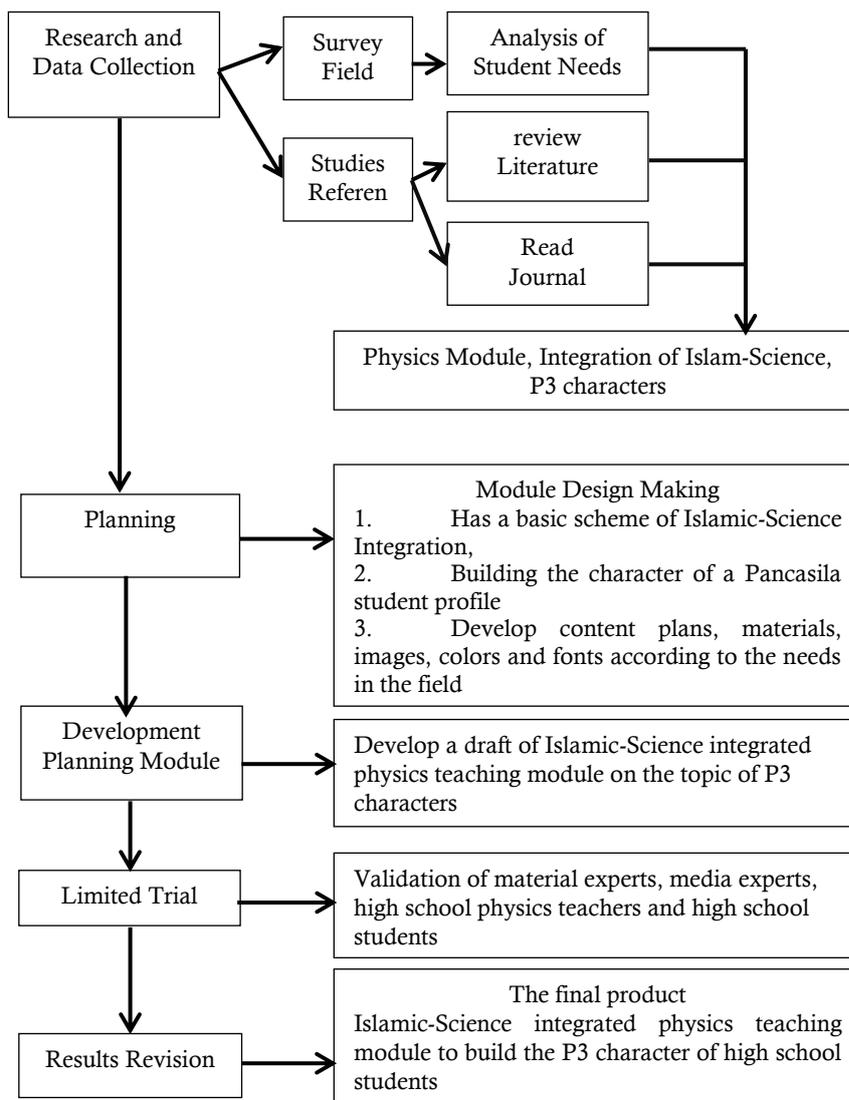


Figure 1: E-module Development Procedures

This e-module is expected to build the PSP character of high school students and can assist teachers in carrying out the learning process. In addition, it is hoped that this e-module can help students learn independently, individually, and in groups. The product research and development model of the Islamic-Science integrated physics learning E-module utilizes a modification of the research and development steps proposed by Borg & Gall. Borg, WR, and Gall (2003) stated that there were ten steps to implementing the research and development strategy, namely (1) research and data collection, (2) planning, (3) product draft development, (4) initial field trials, (5) revising the trial results, (6) field trials, (7) field test product improvement, (8) field implementation tests, (9) final product improvement, (10) dissemination and implementation. However, in this study, only five initial steps were taken, namely (1) research and data collection, (2) planning, (3) product draft development, (4) initial field trials, and (5) revising the trial results.



RESULT AND DISCUSSION

Developing an Islamic-Science integrated physics e-module on PSP character-building material aims to support the teaching and learning process at the high school level. The physics e-module was developed with the connection between the Qur'an and science. Physics has a connection with the verses of the Qur'an, so it becomes a must when studying physics accompanied by a study of the verses of the Qur'an that underlies it. This means that the Qur'an is a source of knowledge. Humans must always make the Qur'an a guide in acting, behaving, and acting. To function the Qur'an, Muslims are required to practice the Qur'an in everyday life, apart from knowing and understanding it.

E-modules are teaching materials that are systematically designed so that students understand the learning objectives in detail and can be accessed by students anytime and anywhere. The developed e-module contains learning objectives, materials, and evaluations, where students can learn according to their abilities. From the explanation above, it can be concluded that an e-module is a form of teaching material packaged as a whole and systematically, containing everything needed in the learning process so that students can learn independently and according to their abilities. E-modules are used to make it easier for students to understand the material presented, where students can learn at their own pace. From the explanation above, it can be concluded that an e-module is a form of teaching material packaged as a whole and systematically, containing everything needed in the learning process so that students can learn independently and according to their abilities.

E-modules are structured in such a way that the goals are clear, specific, and students are directed to achieve them. The novelty of the developed e-module compared to existing books is 1) learning objectives that integrate the Qur'an and Natural Sciences, 2) instructions for using the e-module equipped with explanations to make it easier for students to use the developed e-module, 3) verses of the Qur'an and their translation according to the physics concepts used, 4) scientific information and scientific figures contained on the e-module side, and 5) student worksheets containing questions about the relationship between the Qur'an and science and how to build students' PSP character.

Islamic-Science Integrated Physics E-Module Products

The research product of this development is an integrated Islamic-Science physics e-module based on the physics topic of class X. The topic of this lesson is to build the PSP

character of high school students through intra-curricular and co-curricular learning in PSP reinforcement projects, providing opportunities for students to learn in informal situations. , flexible learning structures, more interactive learning activities, and being directly involved with the surrounding environment to strengthen various competencies in PSP (Geraldine, 2005). In supporting intracurricular and co-curricular programs, the aim is for students to have the basic knowledge, personality, intelligence, noble character, and skills to live independently and participate in further education (Sukardi, 2016).

The main objective of character education is to be able to form a society that is noble, tough, has good or bad judgments, is competitive, works together, has convictions, loves the motherland, easily adapts to surrounding circumstances, and reviews science and technology. Everything is done based on Pancasila with determination and piety to God Almighty (Afifatimah & Surakarta, 2023). The developed e-module consists of several parts, namely: a) cover page, b) preface, c) instructions for using the e-module, d) table of contents, e) introduction, f) concept map, g). material, h) sample questions, i) understanding test, j) summary, k) evaluation, l) warning (feedback), m) enrichment, and n) bibliography.

Results of the Physics E-Module Product Assessment Integrated Islam-Science

Product appraisal results of the Islamic science integrated physics e-module are in the form of lesson plan validation, the results of the e-module feasibility trials, and the results of limited trials by students. Limited trials by students were carried out to obtain data on the suitability of the e-module. The following is a complete explanation.

Physics E-module Feasibility Test

Eligibility data modules were obtained from material experts, media experts, and two high school physics teachers. The data obtained consists of quantitative data and qualitative data. Quantitative data in the form of an e-module assessment sheet is used to determine the feasibility of the e-module. At the same time, qualitative data in the form of suggestions are used to improve the e-module. The results of the analysis of the feasibility components of the learning e-module are presented in Table 1.

Table 1. Results of the Feasibility Component Analysis of the Learning E-module

No	Component	Percentage	Criteria
Content Eligibility			
1	The problems presented	0.67	Currently
2	Material scope	1.00	Tall
3	Practical activity sheet	1.00	Tall

No	Component	Percentage	Criteria
4	Problems example	0.67	Currently
5	Exercise	1.00	Tall
Eligibility of Presentation			
1	Layout	0.83	Tall
2	Color	1.00	Currently
3	Picture	1.00	Tall
4	Cover	1.00	Currently
Language Eligibility			
1	The language used in presenting the problem	0.83	Tall
2	The language used in the material	0.67	Currently
3	The language used in the questions	0.83	Tall

Table 1 shows that the feasibility test results are from experts on e-module physics integrated Islam-Science on building the PSP character of high school students was declared valid because it obtained a V Aiken score of 0.90, more significant than 0.7. So, the draft of the Islamic-Science integrated physics e-module developed to build the PSP character of high school students can fulfill the eligibility and be continued in the next test. The Islamic-Science integrated physics e-module on building PSP character for high school students was tested for its feasibility by two lecturers (as material experts and media experts) and two high school physics teachers. Teacher validation is carried out because it will help share teaching product drafts with colleagues or co-workers familiar with students or targets. The feasibility test was carried out to see the feasibility of the content, presentation, and language.

The Practicality of Physics E-Module

Practicality Assessment Results The e-module is carried out with the lesson plan implementation sheet. Categories are convenient because the e-modules developed are designed to be easy to use through scenarios made in the lesson plan. The Learning Implementation Plan (LIP) or Teaching Module (TM) is described in detail and clearly, in order to make it easier for the teacher to regulate the use of the tools for the teacher himself or students, such as the use of e-modules and student activity sheets contained in e-modules effectively and efficiently.

The practicality of the e-module as one of the developed Islamic-Science integrated physics e-modules can be easily used in learning. The e-module is said to be practical if the practical category is obtained from the results of the practicality assessment of the e-module so that it can be said that the e-module physics interrelation of the Qur'an and the subject matter of building PSP characters is easy to use during the learning process. The data obtained consists of two data, namely quantitative data and qualitative data.

Quantitative data is in the form of lesson plan assessment sheets with Likert scale criteria. At the same time, the qualitative data is in the form of suggestions for improving the TM. The results of the TM validation analysis are presented in Table 2.

Table 2 Results of TM Validation Analysis

No	Execution	Observer 1	Observer 2	Average percentage	Category
1	Subject Identity	90	90	90	Very good
2	Competence	76	87	82	Good
3	Indicators of Competence Achievement	86	90	88	Very good
4	Learning objectives	88	91	90	Very good
5	Learning materials	89	89	89	Very good
6	Learning model	88	94	91	Very good
7	Learning Steps	93	92	93	Very good
8	Learning Resources	91	83	87	Very good
9	Evaluation	87	90	89	Very good
Average				89%	

Based on Table 2, the results of observations of the implementation of learning during teaching and learning activities using the Islamic integrated physics e-module, which had been developed, obtained an average percentage of two observers of 89% and met the excellent criteria. So it can be concluded that Islamic-Science integrated physics e-module has been declared practical by observers in terms of implementing learning activities in limited trials at SMAN 1 Piyungan. Therefore, Islamic Science integrated physics e-module has already been implemented in class. A product resulting from development can be considered practical when viewed from the observations of the implementation of learning with a minimum sufficient category based on qualifications with a percentage of $70 \leq k < 80$.

The Effectiveness of the Physics E-module

Student responses are used to see the effectiveness of the e-module integrated physics of Islam science that has been developed. The effectiveness of the developed e-module is viewed from the realm of the student's character. E-modules must be effective in achieving the objectives of teaching and learning activities. The developed e-modules are also cited from various sources to complement incomplete student teaching materials and with clear and easy-to-understand instructions for using the e-modules. Information that adds insight to students besides the material in the e-module is integrated with the verses of the Qur'an. Learning becomes more effective, engaging, and fun which can make students excited to learn this e-module independently and with teacher guidance. This is reinforced by Sujanem (2012), that modules are used in the learning process, namely providing essential

information, providing teaching materials for students, providing complementary knowledge, and being a practical teaching guide. From the cognitive results of students, namely pre-test scores and even post-test results, it can be seen that the effectiveness of learning can determine the effectiveness of the e-module being developed. This questionnaire is given at the end of the teaching and learning process. The results of the analysis can be seen in Figure 2.

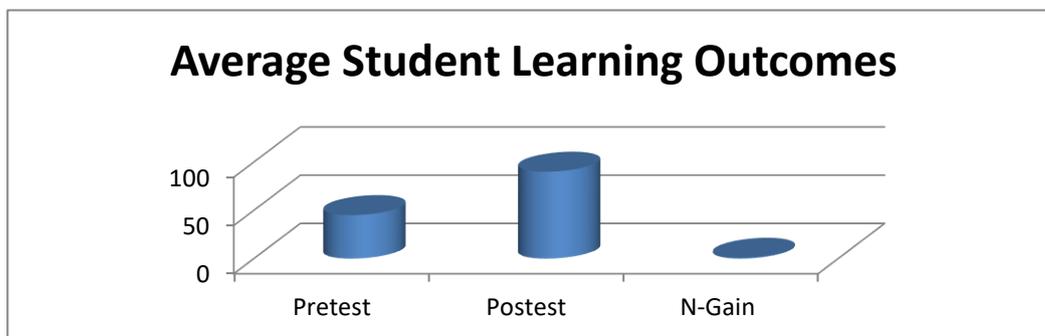


Figure 2: Average Student Learning Outcomes

Figure 2 shows that of the 36 students, 19 people, namely 54.2%, were included in the strongly agree category. In contrast, as many as 15 people, or 43%, were included in the agreed category, then one person, namely 3%, was included in the disagree category. This shows that student's responses to the integrated physics module Islam-Science strongly agree or are very positive, with an average of 97.1%, meaning that the e-module that has been developed is very attractive to students.

This e-module is structured based on core competencies, essential competencies, and problem-solving abilities. This is useful for setting indicators and learning objectives that must be achieved. E-modules are packaged into more specific units in six learning activities according to predetermined indicators and learning objectives. At the end of the activity, a summary of the material is presented. This follows the self-instructional criteria for preparing e-modules by (Hudha et al., 2017), which states that the module must contain material packaged into small units, formulated objectives, and a summary of the learning material.

The subject of building PSP character for high school students is implemented through intracurricular activities integrating PSP character building of faith and piety to God Almighty, virtuous and noble character through praying together before starting lessons, singing Indonesia Raya song, starting by reading the Qur'an, ending by praying and singing songs to your country. This material relates learning content to the greatness of



God Almighty, mentions the arguments of the Qur'an and hadith related to the content or competencies it teaches, intersperses with reflections and studies or invitations and *tausiah*, gets used to working together and collaborating, trains mutual respect help and do good deeds, care about the class environment and surroundings, speak polite and noble words then co-curricular action activities outside of learning with implementation in the environment and community Duha prayer, Worshipers at the mosque on time/WMO (Duhur and Asar Congregation at the On Time Mosque), Friday prayer congregation, Duhur *Kultum*, *tausiah* during the flag ceremony coaching mandate, collaboration with the community around, community service, village cleaning, cultural carnival, caring for and protecting the environment and nature conservation, work titles, regular recitation of students and parents. The e-module is prepared by adopting the steps of Islamic-Science Integration through the activities contained in the e-module. The results of the development of this e-module follow the criteria for compiling e-modules that e-modules should have high adaptive power towards building the PSP character of high school students (Setiyadi, 2017).

The components of the e-module content are adjusted to the stand-alone criteria for the preparation of e-modules by the developed e-modules that do not depend on other media or do not have to be used together with other learning media. Based on these criteria, the concepts in each learning activity are arranged correctly and according to basic competencies. The correctness of the concept and suitability of the material with the basic competencies are intended so that teaching materials or other media are not used simultaneously with the Islamic-Science integrated physics learning e-module to build the character of the Pancasila profile.

Character or morals will be directly proportional or balanced with the results of the achievements of students in everyday life both in terms of cognitive, psychomotor, and attitude because the importance of knowledge and education is evident from the basis of their faith so that they can increase the creativity and responsibility of students. An important element that needs to be considered is that in Integrated Education, teaching and learning activities always consist of knowledge that is integrated from the mind and heart so that, in the end, it produces individuals who are not only academically superior but also who are respectable and responsible and able to contribute well (Fahyuni et al., 2020).

The final product of this research is an Islamic-Science integrated physics e-module on building the PSP character of high school students. The integrated Islam-Science e-module is an e-module that explains the relationship between physics and the Qur'an and Hadith. The physics e-module that has been developed can be used in Islamic-Science integrated class X high school physics learning. Islamic-Science integrated SMA class X physics e-module as a result of research.

CONCLUSION

Based on the results and discussion of the research and development of an Islamic-Science integrated physics learning e-module as building PSP characters for high school students, it can be concluded that the development of Islamic-Science integrated physics e-module on PSP character building material is feasible to use because it has excellent quality with a very valid level of validity based on two validators. E-modules are also said to be practical based on the results of observations of the implementation of learning included in the outstanding category, and high school teachers can use effectiveness in terms of the results of the effectiveness test. This shows that the Islamic-Science integrated physics e-module can be implemented for high school students.

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